

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1.(currently amended): A liquid ejection head, comprising:
a liquid chamber, which stores liquid therein;
a nozzle orifice, adapted to eject a liquid droplet therefrom;
a pressure generating portion, provided in an ~~ink~~ liquid channel communicating a
~~common ink~~ the liquid chamber and a the nozzle orifice;
~~a vibration~~ an elastic plate, which defines a part of the pressure generating portion, ~~so that~~
~~liquid in the pressure generating portion is ejected from the nozzle orifice as a liquid droplet by~~
~~deforming the vibration plate;~~
a piezoelectric vibrator, comprising:
a first common electrode, provided on a surface of the vibration plate which is opposite to
a surface facing the pressure generating portion, and electrically connected to a common
potential;
a first piezoelectric layer, provided on the first common electrode;
a drive electrode, provided on the first piezoelectric layer, and electrically connected to a
signal source for supplying a drive signal;
a second piezoelectric layer, provided so as to cover the drive electrode; and
a second common electrode, provided on the second piezoelectric layer, and electrically
connected to the common potential, the piezoelectric vibrator being deformed in accordance with
the drive signal supplied to the drive electrode, so that the elastic plate is deformed to vary a

volume of the pressure generating portion, thereby ejecting the liquid droplet from the nozzle orifice; and

a liquid supply port, arranged between the ~~common ink~~ liquid chamber and the pressure generating portion to serve as an orifice,

~~wherein the piezoelectric vibrator has a multilayer structure which comprises:~~

~~an upper piezoelectric layer and a lower piezoelectric layer, laminated one on another;~~

~~a drive electrode, formed at a boundary between the upper piezoelectric layer and the lower piezoelectric layer, and electrically connected to a supply source of a drive signal;~~

~~an upper common electrode, formed on a surface of the upper piezoelectric layer; and~~

~~a lower common electrode, formed on a surface of the lower piezoelectric layer; and~~

wherein an inertance of the nozzle orifice and an inertance of the liquid supply port are greater than an inertance of the pressure generating portion.

2.(currently amended): The liquid ejection head as set forth in claim 1, wherein a thickness of the upper first piezoelectric layer and a thickness of the lower second piezoelectric layer are set to 10 μm or less.

3.(currently amended): The liquid ejection head as set forth in claim 1 ~~or 2~~, wherein the inertance of the nozzle orifice and the inertance of the liquid supply port are each set so as to be more than double the inertance of the pressure generating portion.

4.(currently amended): The liquid ejection head as set forth in ~~any one of claims 1 to 3~~ claim 1, wherein the pressure generating portion comprises:

a ~~rectangular parallelepiped~~ pressure chamber, a volume of which is varied by the deformation of the elastic plate which defines ~~one face~~ a part of the pressure chamber;

a nozzle communication port, communicating ~~one~~ a first longitudinal end of the pressure chamber and the nozzle orifice; and

a supply-side communication port, communicating ~~another~~ a second longitudinal end of the pressure chamber and the liquid supply port; and

wherein a ~~length~~ longitudinal dimension of the pressure chamber is set to 1.1 mm or less.

5.(currently amended): The liquid ejection head as set forth in ~~any one of claims 1 to 4~~ claim 1, wherein an amount of the deformation of the piezoelectric vibrator is set to a value of 0.16 μm or more.

6.(currently amended): The liquid ejection head as set forth in ~~any one of claims 1 to 5~~ claim 1, wherein a compliance of the piezoelectric vibrator is set to a compliance of the liquid or less.

7.(currently amended): The liquid ejection head as set forth in ~~any one of claims 1 to 6~~ claim 1, wherein a volume of the liquid droplet ejected from the nozzle orifice is set to 6 pL or more, and an ejection frequency of the liquid droplet is set to 50 kHz or higher.

8.(currently amended): The liquid ejection head as set forth in ~~any one of claims 1 to 6~~ claim 1, wherein a volume of the liquid droplet ejected from the nozzle orifice is set to 3 pL or less, and an ejection frequency of the liquid droplet is set to 30 kHz or higher.

9.(currently amended): The liquid ejection head as set forth in ~~any one of claims 1 to 8~~ claim 1, wherein a natural period of the pressure generating portion is set to 7 μ s or less.